UNIVERSITY OF CALIFORNIA LAWRENCE LIVERMORE NATIONAL LABORATORY

ENVIRONMENT, SAFETY, AND HEALTH PROVISIONS

Except as otherwise stated herein, the following clauses shall apply to any work and other activities performed by the Subcontractor or its lower-tier subcontractors under this Subcontract at any U.S. Government location managed or operated by the University, including the Lawrence Livermore National Laboratory ("LLNL") and its Site 300, or at any other location except Subcontractor or lower-tier subcontractor facilities. As used herein, the term "Subcontractor" shall also mean "Seller" and the term "Subcontract" shall also mean "Purchase Order".

1.0. Integration of Environment, Safety, and Health into Planning and Execution

a. For the purposes of this clause, safety is understood to encompass environment, safety and health, (ES&H) including pollution prevention and waste minimization; and employees is understood to include Subcontractor employees and lower-tier subcontractor employees performing work under this Subcontract, and University employees.

b. In performing work under this Subcontract, the Subcontractor shall work safely, in a manner that ensures adequate protection for employees, the public, and the environment, and shall be accountable for the safe performance of the work. The Subcontractor shall exercise a degree of care commensurate with the work and the associated hazards. The Subcontractor shall ensure that management of ES&H functions and activities becomes an integral but visible part of the Subcontractor's work planning and execution processes. The Subcontractor shall, in the performance of work, ensure that:

(1) Subcontractor line management is responsible for the protection of employees, the public, and the environment. Subcontractor line management includes those Subcontractor and lower-tier subcontractor employees managing or supervising employees performing work.

(2) Clear and unambiguous lines of authority and responsibility for ES&H are established and maintained at all Subcontractor organizational levels.

(3) Subcontractor personnel possess the experience, knowledge, skills and abilities that are necessary to discharge their responsibilities.

(4) Resources are effectively allocated to address ES&H considerations for the work to be performed; and protecting employees, the public, and the environment is a priority whenever activities are planned and performed.

(5) Before work is performed, the associated hazards are evaluated and the ES&H standards and requirements contained or referenced in this subcontract, are implemented or fulfilled by the Subcontractor, so as to provide adequate assurance that employees, the public, and the environment are protected from potential adverse consequences of the work to be performed.

(6) Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards. Emphasis should be on designing the work and/or controls to reduce or eliminate the hazards and to prevent accidents and unplanned releases and exposures.

(7) The "conditions and requirements" to be satisfied for work to be initiated and conducted are established and agreed-upon by the University and the Subcontractor. These agreed upon "conditions and requirements" are requirements of this Subcontract and binding upon the Subcontractor.

c. The Subcontractor shall manage and perform the work in accordance with a Safety Management System (System) documented to fulfill all conditions in paragraph b above at a minimum. The System shall also describe how the Subcontractor will:

(1) Define the work activities that will be performed;

(2) Identify and analyze hazards associated with the work;

(3) Develop or select applicable controls based on the hazards and requirements of this subcontract;

(4) Ensure the controls work properly, and perform work within the controls;

(5) Monitor work and provide feedback on adequacy of controls, and continue to improve safety management.

d. The System shall describe how the Subcontractor will establish, document, and implement safety performance objectives and commitments. The System shall also describe how the Subcontractor will measure system effectiveness.

e. The Subcontractor shall submit to the University a Task Identification Process (TIP) List for review and approval. Dates for submittal, discussions, and revisions to the TIP List will be established by the University.

f. The Subcontractor shall comply with, and assist the University and the U.S. Government in complying with, ES&H requirements of all applicable laws and regulations, and applicable directives identified in this Subcontract. The Subcontractor shall cooperate with the University, federal, state, and local agencies having jurisdiction over ES&H matters under this Subcontract.

g. The Subcontractor shall promptly evaluate and resolve any noncompliance with applicable ES&H requirements of this Subcontract. If the Subcontractor fails to provide resolution or if, at any time, the Subcontractor's acts or failure to act cause substantial harm or an imminent danger to the environment or health and safety of employees or the public, the University may issue an order stopping work in whole or in part. Any stop work order issued by a University Representative under this clause shall be without prejudice to any other legal or contractual rights of the University or U.S. Government.

In the event that the University issues a stop work order, an order authorizing the resumption of the work may be issued at the discretion of the University. The Subcontractor shall not be entitled to an extension of time or additional fee or damages by reason of, or in connection with, any work stoppage ordered in accordance with this clause.

h. The Subcontractor is responsible for ensuring that its employees and all lower-tier subcontractor employees performing under the Subcontract comply with the ES&H requirements applicable to this subcontract Subcontract. Accordingly, the Subcontractor shall apply the ES&H requirements of this Subcontract to all lower-tier subcontractors to the extent necessary to ensure the Subcontractor's compliance with the requirements. The Subcontractor shall include a clause substantially the same as this clause in lower-tier subcontracts involving complex or hazardous work. Such subcontracts shall provide for the right to stop work under the conditions described in paragraph (g) above.

i. The Subcontractor shall immediately report to the University any occupational injury, illness, or release of hazardous materials into the environment, associated with performance under this Subcontract. The Subcontractor shall additionally cooperate with the University and provide a written report of the incident. (e.g. a First Report of Injury). This includes allowing the University to review the Subcontractor's "Log and Summary" of all recordable occupational injuries and illnesses (OSHA No. 200 Form or State Equivalent) maintained by the Subcontractor.

j. The Subcontractor shall allow the University access to all Subcontractor written Injury and Illness Prevention Program (IIPP) established, or which is by law to be established.

1.1 Subcontractor's Safety Documentation Requirements

a. Task Identification Process (TIP) List

The Subcontractor shall complete and submit a TIP List to the University for approval in support of the Subcontract Statement of Work. The TIP List is a checklist intended to identify the major concerns common to most work activities and assist in identifying potential hazards to be mitigated. Based on the TIP List response, the University may require from the Subcontractor additional job specific documentation specifying work procedures used.

b. Commencing Work

(1) Performances at the work site shall not commence until the University approves the Subcontractor's TIP List and issues a written notice to proceed. The Subcontractor shall not be entitled to a cost or schedule adjustment due to failure to submit an acceptable TIP list.

(2) After Subcontractor's authorization to proceed has been given by the University, Subcontractor's personnel intended to perform work may be required, at the University's election, to attend a safety briefing with the University's designated personnel before commencing any performance at the work site.

c. Failure to conform to and comply with all applicable ES&H provisions of this Subcontract, or the TIP List shall subject the Subcontractor to responses which may include, but are not limited to, stoppage of work pending acceptance of the Subcontractor's cure proposal, withdrawal of security access badges for violators, withholding of progress payments until violations are cured or corrected, and termination for default.

1.2 Environment, Safety, & Health Requirements

a. Safety - Protection of Persons and Property

(1) The Subcontractor shall be solely responsible for initiating, maintaining, and supervising all safety provisions, precautions, and programs in the course of the performance of the Subcontract.

(2) The Subcontractor shall take adequate steps and precautions for the safety of and shall provide adequate protection to prevent damage, injury, or loss to the following:

(a) University or Subcontractor employees involved in the Subcontract work and other persons who may be affected thereby.

(b) The completed Subcontract work in place, and other materials and equipment to be incorporated therein, whether in storage on or off the project site, under care, custody, or control of the Subcontractor or lower tier subcontractors.

(c) Other property that may be present at the project site and other adjoining areas.

(3) The Subcontractor shall erect and maintain, as required by existing conditions and performance of the subcontract, adequate safeguards for safety and protection, including providing adequate lighting and ventilation, posting danger signals and other warning signs against hazards, promulgating safety regulations, and notifying the University Representative and other subcontractors at or near the project site, adjacent sites, and utility sites.

(4) No explosives, hazardous or radioactive materials or equipment shall be brought to the work location without the prior written approval of the University. The Subcontractor shall submit for review and approval by the University, along with or as part of their TIP List detailed descriptions, plans and procedures for the use or storage of explosives, hazardous or radioactive materials, hazardous equipment (including radiation generating devices) or unusual methods. The Subcontractor shall exercise the utmost care and carry on such activities only under the supervision of properly qualified personnel.

(5) The Subcontractor shall designate a responsible member of the Subcontractor's organization at the work site whose duty shall be responsible for ensuring compliance with ES&H requirements of this Subcontract.

(6) The University's Site 300 location is an area where explosives are processed, transported, and tested and the area shall be treated as a hazards area.

(a) All Subcontractor's employees seeking access to Site 300 job sites for the first time under this Subcontract shall attend a 15-minute pre-job safety briefing at Site 300.

(b) Because of the nature of the operating activities at Site 300, all safety/site access regulations and requirements are strictly enforced and shall be complied with at all times by the Subcontractor.

b. Training

The Subcontractor shall ensure that their employees are appropriately trained and receive appropriate LLNL ES&H training, or equivalent, or have them escorted and supervised by LLNL personnel knowledgeable in the LLNL site specific hazards to which they may be exposed while at the work location.

c. Medical Surveillance and Evaluations

The Subcontractor shall have an identified health care provider for appropriate preplacement, medical surveillance and fitness for duty evaluations required for Subcontractor employees by OSHA or this Subcontract. The Subcontractor shall comply with OSHA preplacement and medical surveillance requirements or any additional preplacement or medical surveillance standards identified by the University in this Subcontract for the specific work involved. The Subcontractor shall instruct the identified health care provider to provide immediate notification to the University (Health Services Department, LLNL (925)422-7459) in the event of work related health abnormalities found by an OSHA or University required examination.

d. Emergency Notification

In an emergency affecting the safety of persons or property, the Subcontractor shall immediately call 911 from an LLNL system phone, or (925) 447-6880 (LLNL Emergency Dispatch Center), if calling from an offsite, pay, or cellular phone, and take appropriate action to prevent or minimize damage, injury, or loss. The Subcontractor shall promptly notify the University Representative, which notice may be oral followed by written confirmation, of the occurrence of such an emergency and the action taken by the Subcontractor.

e. Work Specific Requirements (As Applicable)

(1) Confined Spaces:

(a) A confined space is defined as an enclosed area that: 1) is large enough for an employee to enter and perform assigned work; 2) has limited or restricted means of entry or exit; and 3) is not designed for continuous human occupancy.

(b) Confined spaces include, but are not limited to, trenches and excavations (typically greater than four feet in depth but actually dependent on the activities being performed), vaults, and tanks. All entries into confined spaces at the work location, including those related to construction activities, shall be performed in accordance with 29 CFR 1910.146.

(c) The Subcontractor shall include a section on their Confined Space Program as part of their additional safety documentation provided with the TIP List.

(2) Electrical Safety: Ensure that all necessary safety procedures are followed when working with electricity. Demonstrate in additional safety documentation that all project-specific electrical safety considerations are addressed, including (but not limited to) the following:

(a) Qualification of Personnel: All electrical work shall be performed by qualified electricians in accordance with 29 CFR 1910 and 29 CFR 1926.

(b) If exposed, energized parts are encountered where none were expected, particularly during testing of tagged-out circuits (in accordance with paragraph below), stop work immediately and contact the University for guidance before proceeding.

(c) Working on Energized Equipment: If work on energized circuits or equipment is anticipated during this project, address this work in additional safety documentation and provide persons qualified to perform such work, along with all necessary safety equipment specified in 29 CFR 1910 and 29 CFR 1926. Notify the University 14 days in advance of working on energized equipment.

(d) If in the course of the work non-electricians may be required to work near exposed, energized equipment, explain this work in additional safety documentation and notify the University 14 days in advance of performing the work. The University may provide guidance for performing such work.

(e) If the Subcontractor will be working near potentially hazardous electrical equipment in the course of this Subcontract, the additional safety

documentation must address this activity. The University may provide guidance for working in the vicinity of such equipment.

(3) Lockout/Tag: The Subcontractor shall have a program for the isolation and control (lockout/tag) of energy sources for equipment to be worked on in accordance with 29 CFR 1910.147, and 29 CFR 1910.333, Subpart S, "Electrical." Although OSHA permit the use of only a tag with no lock; however, this is not allowed at LLNL - both a lock and tag are required. Coordinate all lockout and tag of circuits in advance with the University; do not perform lockout and tag before obtaining the University's approval.

(4) Material Safety Data Sheets (MSDS's): The Subcontractor shall submit MSDS's for all chemicals, oils, solvents, paints, epoxies, adhesives, petrochemical, or similar materials used at the work location. The Subcontractor shall maintain copies of these MSDS's in a readily accessible location onsite. The Subcontractor shall dispose of all such materials in accordance with the applicable federal, state, and local regulations. The Subcontractor shall also complete, and submit to the University, the LLNL Hazardous Material Inventory form (form to be provided by the University). A copy of the completed forms shall be retained, by the Subcontractor, with the MSDS's for the work. If any hazardous materials are to remain onsite at the end of the work, the Subcontractor must contact the LLNL ChemTrack Hotline (925) 424-4404.

f. Protection of the Environment

(1) Materials and Waste Discharge: The Subcontractor shall not discharge hazardous materials or wastes onto LLNL Property, the environment (i.e., air, soil, surface water, and groundwater) or to the sanitary sewer. Subcontractor shall protect all routes of entry to the environment, including direct discharges into air, soil, surface water, storm sewer, sanitary sewer, wells, and drainage channels, from work activities. This shall be achieved by the safe and proper use and storage of tools, equipment, and materials. Subcontractor's construction equipment and vehicles shall be inspected daily for leaks of fuel, engine coolant, and hydraulic fluid. Any leaks shall be contained, repaired, and reported immediately to the University Technical Representative. Subcontractor shall immediately report to the University Technical Representative any accidental discharges into the environment. Subcontractor shall clean up all discharges into the environment according to the guidance provided by an LLNL environmental analyst or Environmental Duty Officer.

(2) Air Quality: The Bay Area Air Quality Management District (BAAQMD) and the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) regulate the use of solvents in cleaning operations and the solvent content of chemical products such as paints, other surface coatings, sealants, adhesives, etc. These air districts also regulate the application methods and materials used in abrasive blasting, and have general requirements limiting visible air emissions and odor nuisance from any work. The Subcontractor shall ensure that all

products used and work conducted is in compliance with BAAQMD and SJVUAPCD regulations.

(3) Waste Management: All waste (e.g., spent hazardous materials, spill clean up, and like items) generated during performance of the work shall be evaluated by the Subcontractor according to the requirements in CCR Title 22 Section 66261 and 66262 to determine if it meets the definition of a hazardous waste. All hazardous waste will be managed according to the requirements in CCR Title 22 Section 66262.34. If the Subcontractor needs to establish a less than 90-day storage facility to store the waste, the University shall be contacted to review and approve the location and construction of the storage area. The Subcontractor shall only use properly licensed transporters to remove hazardous waste from LLNL to a properly licensed disposal facility approved by LLNL.

(4) Soil and Sewer Contamination:

(a) Subcontractors shall protect storm sewers from demolition and work activities. Only storm water, properly managed pipe flushings, and other non-stormwater discharges specifically identified in a General Construction Activity Stormwater Permit shall be allowed to enter the storm drain. All other materials including, but not limited to, abrasive blasting grit, pavement washings, construction debris, and waste are prohibited discharges to storm drain.

(b) The Subcontractor shall notify the University of any unexpected subsurface conditions including unusual staining or other evidence of soil contamination.

g. Protection of Historic or Palentological Resources

(1) Subcontractor shall immediately report any evidence of unidentified cultural resources unearthed during excavation to the University. Subcontractor shall stop all work within 150 feet of the find until it has been assessed by the University and a verbal notice to proceed is issued. Known historically-sensitive or palentological resource areas will be marked by staking, fencing, and pink/black diagonally-striped flagging. Avoid these areas during construction. Examples of unidentified cultural resources include:

(a) Prehistoric archaeological deposits such as obsidian or chert flakes or tools; ground-stone mortars, slabs, or pestles; cultural deposits of shell or dietary bone; locally darkened midden (trash) soils; and human interments.

(b) Historic-period archaeological materials such as foundations or other structural remains; refuse deposits; backfilled wells or privies; square nails; and sun-tinted glass.

(c) Bones, teeth, or other animal remains, or fossilized similar remains.

(2) Subcontractor shall not collect, deface, excavate, or destroy any objects of antiquity. Examples of such objects include stone-flaked or ground tools, bones, shells, beads, bottles, nails, barbed wire, ceramic pieces, buttons, weathered boards, and tin cans. Leave these objects undisturbed. If discovered, leave in place, note their location, and immediately notify the University.

h. Protection of Sensitive Natural Resources

(1) Federally endangered and threatened animal and plant species, as well as State of California Species of Special Concern exist at LLNL sites. These resources require special protection and application of mitigation measures, depending on their location and the extent and location of the proposed contract work activity. Protection and management requirements as penalties for noncompliance are outlined in a series of Federal and State laws. Such resources include, but are not limited to:

(a) Animals such as: white shouldered kite, tiger salamander, red legged frog, burrowing owl, golden eagle, Alameda whipsnake, American badgers; and

(b) Plants such as: the blue elderberry bush, large flowered fiddleneck, tarplant, and diamond petaled poppy.

(2) Subcontractors will request of the University discussion of the presence or absence of such protected resources and any protection requirements prior to the start of any work (or preferably earlier). The Subcontractor is aware that it and its subcontractors and their personnel may be found personally and primarily responsible under Federal or State laws should the laws be violated.

(3) Protected wetland areas and designated flood plains are also present at LLNL's sites. Protection and management of these resources are covered under Federal and State laws and regulations, and Federal executive orders. Subcontractor shall discuss with the University regarding the presence of such resources in projected work areas, to elicit and understand protection requirements, and to comply with such requirements to avoid damage to the resources and to reduce the potential for liability for noncompliance.

1.3 Work Areas

a. The Subcontractor shall keep the work location clean at all times and shall remove accumulated debris each day. If, in the opinion of the University, the work location has not been kept clean and orderly and presents a potential safety, environmental, or fire hazard, the Subcontractor may be required to stop work in the affected area and immediately correct the defects at no additional cost to the University, including lost time for clean-up effort. Painting and finish work shall not commence until work locations have been cleaned and dusted to the satisfaction of the University. At the end of the work, the Subcontractor shall remove all debris, excess materials, tools, equipment,

temporary buildings, barricades, empty containers, and like items, from the work location and shall clean all areas used in the performance of this work.

b. Wastes generated from hazardous materials used by the Subcontractor, or its sub-subcontractors, are the responsibility of the Subcontractor and shall be stored, handled, and disposed of in accordance with applicable Federal, state, local environmental regulations. These wastes may include, but are not limited to, batteries, paints, solvents, oils, and greases as well as their empty containers.

c. If, in the opinion of the University, any condition exists at the work location, caused by the Subcontractor, that may present a potential safety, environmental, or fire hazard, it shall be the responsibility of the Subcontractor to immediately correct the condition at no additional cost to the University.

2.0 ES&H Laws and Regulations

In addition to all applicable Federal, State, and local ES&H regulations, the requirements of the following governmental regulations and order apply to all work performed under this Subcontract as applicable:

10 CFR 835 - Occupational Radiation Protection
29 CFR 1910 - Occupational Safety and Health Act (OSHA)
29 CFR 1926 - Occupational Safety and Health Act (OSHA)
40 CFR 192 - Pipeline Safety Standards
DOE Order 5820.2A - Radioactive Waste Management

2.1 National Technical Codes and Standards

a. Technical codes, standards, and guides promulgated by nationally recognized organizations are to be used by the Subcontractor whenever available and practical. A partial listing of nationally recognized organizations is provided below. Exceptions shall be limited to those cases where the Subcontractor has formally requested and being granted either an exemption or a finding of equivalency by the University.

b. The Subcontractor shall bring any conflicts between specifications, drawings, and the referenced documents to the attention of the University, in writing, for resolution before taking any related action. Where differences exist between codes and standards, the one with the most stringent requirement, as determined by the University Representative shall apply.

American National Standards Institute (ANSI)

ANSI A10 Series	Safety Requirements for Construction
ANSI B30 Series	Safety Standards for Cranes and Hoists
ANSI C2	National Electrical Safety Code
ANSI Z136.1	Laser Safety
ANSI/NFPA 110	Standard for Emergency and Standby Power Systems

Safety standards, as applicable

International Conference of Building Officials (ICBO)

ICBO UBC	Uniform Building Code
ICBO UMC	Uniform Mechanical Code

International Association of Plumbing and Mechanical Officials (IAPMO)

IAPMO UPC	Uniform Plumbing Code

National Fire Protection Association (NFPA)

NFPA 70	National Electrical Code
NFPA 72	National Fire Alarm Code
NFPA 101	Life Safety Code
NFPA 241	Standard for Safeguarding Construction, Alteration, and Demolition Operations

Other Fire Codes, as applicable

Other Standards

American Council of Government Industrial Hygienists (ACGIH), Threshold Limit

Values for Chemical Substances/Physical Agents/Biological Exposures (current edition)

All applicable federal, state, and local environmental regulations

All applicable federal, state, and local safety and health regulations, including Subcontractor's approved safety procedures

c. If differences are discovered between the revisions of the code or standards cited herein and those that are current during the execution of the work, the differences shall be brought to the attention of the University Technical Representative in writing and resolved as needed.